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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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EXAMINER
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ART UNIT	PAPER NUMBER
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DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

# Office Action Summary

Application No.  
09/376,063

Applicant  
Seigi

Examiner  
Michael Datskovsky

Group Art Unit  
2835



X Responsive to communication(s) filed on Dec 11, 2000

This action is **FINAL**.

Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

X Claim(s) 20, 22, 24, and 25 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

Claim(s) \_\_\_\_\_ is/are allowed.

X Claim(s) 20, 22, 24, and 25 is/are rejected.

Claim(s) \_\_\_\_\_ is/are objected to.

Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

The proposed drawing correction, filed on \_\_\_\_\_ is approved disapproved.

The specification is objected to by the Examiner.

The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

All Some\* None of the CERTIFIED copies of the priority documents have been received.

received in Application No. (Series Code/Serial Number) \_\_\_\_\_

received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_

Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

X Notice of References Cited, PTO-892

Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

Interview Summary, PTO-413

Notice of Draftsperson's Patent Drawing Review, PTO-948

Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments filed 12/11/2000 have been fully considered but they are not persuasive. Examiner strongly disagrees with applicant's statement that: "Specifically, Barrow only describes solder balls 34, with no distinction whatsoever of particular ones of the solder balls 34 being used for radiating heat from the solder pad 28 or for transmitting purposes, as in the claimed invention." (Page 6, lines 11-15). On the contrary, Barrow (abstract, lines 12-15 and col.3, lines 5-13), used as a reference for Final Rejection, along with references by: Bond, Haley, Pastore et al, Lan et al, all cited before; and also along with newly cited references by: Lin et al, Shim et al, Selna, Horiuchi et al, Sugahara, Yano et al all clearly describe semiconductor packages comprising a heat generating die on the top of a circuit board and two groups of the solder balls on the bottom side of said circuit board, one, central, group for a heat-dissipating and another, peripheral, for transmitting electrical signals.

2. Regarding to the arguments about the patentability of the claimed difference between the pitches of said two groups of solder balls and certain relationships of the distances between said groups of said solder balls: In the specification applicant has not shown either the unexpected results or the criticality of the claimed range of sizes. MPEP provides that: "Applicants can rebut a prima facie case of obviousness based on overlapping ranges by showing unexpected results or the criticality of the claimed range." "The law is replete with cases in which the difference between

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the claimed invention and the prior art is some range or other variable within the claims . . . . In such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range." In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). See MPEP § 716.02 - § 716.02(g) for a discussion of criticality and unexpected results. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955) "

### ***Claim Objections***

3. Claim 24 is objected to because of the following informalities: instead of "in accordance with claim 2", should be: "in accordance with claim 22". Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 20, 22, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Barrow.

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Barrow teaches a semiconductor device, figs. 3-5, comprising: a substrate 12 having a main surface 14 and a back surface 16, wherein said back surface 16 has a central area 38, an intermediate area 42 surrounding said central area 38 and a peripheral area 36 surrounding said intermediate area 42; a semiconductor chip 18 formed on said main surface; a first bump unit formed in said central area of said back surface, wherein said first bump unit radiates heat from said semiconductor device (abstract, lines 12-15); a second bump unit formed in said peripheral area of said back surface, wherein said second bump unit transmits signals (col. 3, lines 6-7), wherein the second bump unit is greater in quantity of solder balls than the first bump unit, and said solder balls are spherical in shape. Barrow does not teach **certain relationships between width of said intermediate area and the** differences between distances (itches) from each other of the **first unit bumps and second unit bumps**. It would have been obvious to one having ordinary skill in the art at the time the invention was made to establish these relationships and itches in the device by Barrow, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Alder, 105 USPQ 233.

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Lin et al (US Patent 5,216,278); Shim et al (US Patent 5,729,432); Selna

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(US Patent 5,640,048); Horiuchi et al (US Patent 6,084,295); Sugahara (US Patent 6,037,656);

Yano et al (US Patent 6,046,499) and Yano et al (US Patent 5,909,058).

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Datskovsky whose telephone number is (703) 306-4535.



Leo P. Picard  
Supervisory Patent Examiner  
Technology Center 2800

M.D.

January 26, 2001